## LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034



## **B.Sc.** DEGREE EXAMINATION – **CHEMISTRY**

## FIRST SEMESTER – APRIL 2023

## UCH 1502 - ANALYTICAL CHEMISTRY

Date: 13-05-2023	Dept. No.	Max.: 100 Marks
Time: 01:00 PM - 04:00 PM		

	SECTION A						
Ansv	wer ALL the Questions						
1.	1. Define the following						
a)	Accuracy	K1	CO1				
b)	ppm	K1	CO1				
c)	Von Weimarn ratio	K1	CO1				
d)	Retention Factor	K1	CO1				
e)	DTG	K1	CO1				
2.	Choose the correct answer $(5 \times 1 = 5)$						
a)	<ul><li>a) Which of the following error is caused by poor calibration of the instrument?</li><li>(i) Random error (ii) Gross error (iii) Instrumental error (iv) Precision error</li></ul>						
b)	b) The normality of one molar sodium hydroxide solution is (i)1.0 N (ii) 2.0 N (iii) 0.5 N (iv) 0.1 N		CO1				
c)	21						
d)	· · · · · · · · · · · · · · · · · · ·						
e)							
3. Match the following			1 = 5)				
a)			CO1				
b) Fe <sup>2+</sup> vs KMnO <sub>4</sub> Precipitation titration.		K2	CO1				
c)			CO1				
d)	d) Camphor Employers		CO1				
e)			CO1				
4.	<u>′</u>						
a) The significant figures of (i) 0.5040 (ii) 6.0235 x 10 <sup>-34</sup> are 4 and 5.		K2	CO1				
b)			CO1				
c)			CO1				
d)			CO1				
e)	e) In TGA analysis, the temperature is kept constant.		CO1				
	SECTION B						
Ansv	wer any TWO of the following in 100 words (2 x	10 = 20	0)				
5.	a. Write a note on Material Safety Data Sheet. (5)	W2	CO2				
	b. Enumerate the general rules in the storage and handling of chemicals. (5)	K3	CO2				

6. a. Define the term mole fraction. Calculate the normality of NaOH if 40 g is dissolved in 250 mL of water.  b. Suggest an indicator for the following titrations. (i) CT vs Ag' (ii) Mg3' vs EDTA (iii) H <sub>2</sub> C <sub>2</sub> O <sub>4</sub> vs NaOH (iv) Fe³ vs K <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub> (v) H <sub>2</sub> C <sub>2</sub> O <sub>4</sub> vs KMnO <sub>4</sub> 7. a. Arrive at the relation between solubility and solubility product.  b. Write a short note on co-precipitation and post precipitation.  column 17. Separate 18. Separate 19. Sepa								
b. Suggest an indicator for the following titrations. (i) CI vs Ag (ii) Mg <sup>3</sup> vs EDTA (iii) H <sub>2</sub> C <sub>2</sub> O <sub>4</sub> vs NaOH (iv) Fe <sup>2*</sup> vs K <sub>2</sub> C <sub>7</sub> O <sub>7</sub> (v) H <sub>2</sub> C <sub>2</sub> O <sub>2</sub> vs KMnO <sub>2</sub> 7. a. Arrive at the relation between solubility and solubility product.  b. Write a short note on co-precipitation and post precipitation.  8. a. Outline the basic principle and the procedure involved in TLC. (5) K3 CO2  SECTION C  Answer any TWO of the following in 100 words  9. a. Illustrate the first aid procedures to be followed in the laboratory.  b. Analyse the DTA curves of calcium oxalate monohydrate in CO <sub>2</sub> and (is) air atmosphere.  10. a. Outline the requirements of a primary standard substance. Cite an example of a primary and secondary standard substance.  b. Calculate the pH of (i) 0.25 N HCI (ii) 0.001 N NaOH  11. a. Explain the theory of adsorption indicators.  b. Discuss the factors affecting the solubility of a precipitate in (5)  Explain the apparatus setup, principle and working procedure for the distillation of two miscible liquids having very close boiling points.  SECTION D  Answer any ONE of the following in 250 words  13. a. Elaborate the different types of errors with examples.  b. Explain the principle and the titration involved in the extination of (10) magnesium by complexometric titration.  14. a. The solubility of PbCl <sub>2</sub> at 25 °C is 4.448 g dm <sup>3</sup> . Determine the value of K <sub>2</sub> .  b. Summarize the principle and working of the ion exchange chromatography with its applications.  c. Interpret the TGA curve of silver nitrate with a neat sketch.  5. CO4  Answer any ONE of the following in 250 words  c. Interpret the TGA curve of silver nitrate with a neat sketch.  c. Derive Henderson equation of an acidic buffer. Mention its significance.  16. a. Explain the principle and procedure involved in the determination of (10) chloride by Volhard's method  b. Write and explain the various steps involved in the recrystallization process.  c. Describe the instrumentation of TGA analysis with a neat block (5)	6.	a.	_					
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	10.		chloride by Volhard's method  Write and explain the various steps involved in the recrystallization	,	K6	CO5		
GIMBI MIII.		b.	chloride by Volhard's method  Write and explain the various steps involved in the recrystallization process.	(5)	K6	CO5		
		b.	chloride by Volhard's method  Write and explain the various steps involved in the recrystallization process.  Describe the instrumentation of TGA analysis with a neat block	(5)	K6	CO5		

